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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,187	06/12/2001	Toshio Morita	Q61610	1960

7590

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EXAMINER

LISH, PETER J

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 07/11/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

A9-6

# Office Action Summary

Application No.

09/878,187

Applicant(s)

MORITA ET AL.

Examiner

Peter J Lish

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 13-16 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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### DETAILED ACTION

Applicant's arguments with respect to claims 11-14 have been considered but are moot in view of the new ground(s) of rejection. Accordingly, the rejection of the previous office action, based on the reference to Kambe et al., is withdrawn.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 13-16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kyotani et al. ("Preparation of Ultrafine Carbon Tubes...").

Kyotani et al. teach a method for the preparation of carbon nanotubes without the use of catalyst material. The nanotubes are also subjected to heat treatment at 2800 °C. It is not explicitly taught that the carbon nanotubes of Kyotani et al. have less than 100 ppm of metal (Fe, Ni, Co, Cu, Mo, Ti, V, or Pd) impurities, however, because none of these metals are present in the nanotubes to effect growth, and additionally due to the high temperature heating of the

nanotubes which will vaporize any metal impurities which may be present, it is expected that the nanotubes of Kyotani et al. will meet this limitation.

Kyotani teaches that the carbon nanotubes have diameters of between 3 and 80 nanometers. Kyotani does not explicitly teach the length of the nanotubes, however, judging from the figures (Figures 4-5), it is expected that the lengths fall within the range of about 1 to 1000 microns. Additionally, by varying the thickness and channel diameters of the anodic oxide film, one can control the length and thickness of the nanotubes.

There is no difference seen between the carbon fibers of Kyotani and those of the instantly claimed invention.

Claims 13-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tamura et al. (USPN 4,435,375).

Tamura teaches a graphite filament having a mineral impurity content of 80 ppm or less, preferably 50 ppm or less, which is produced by a high degree of purification. Carbon fibers are vapor grown from this graphite filament. While the metal impurity content of the carbon fibers are not explicitly taught, it is expected that the metal content is below that of the original graphite material due to the high temperature conditions in which they are grown and the lack of metal introduction into the system. There is no difference seen between the carbon fibers of Tamura and those of the instantly claimed invention.

Claims 13-16 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tennent et al. (USPN 6,235,674).

Tennent teaches the vapor growth of carbon fibers with diameters in the range of 0.1 to 80 microns. Tennent additionally teaches that the fibers are treated under high temperature at 2500-3000 °C in order to convert the entire filament to highly ordered graphitic carbon. Because no difference, which would account for a carbon product of greater or lesser purity, is seen between the process of Tennent and that of the instantly claimed invention, it is expected that the carbon fibers of Tennent have about 100 ppm or less of metal impurities. Regarding the length of the carbon fibers, official notice is taken that vapor grown carbon fibers have lengths between 1 and 1000 microns. There is no difference seen between the carbon fibers of Tennent and those of the instantly claimed invention.

Claims 13-15 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hiraoka et al. (USPN 6,455,160).

Hiraoka teaches the purification of carbon fibers under high temperature treatment at 1800-2400 °C. Because no difference, which would account for a carbon product of greater or lesser purity, is seen between the process of Hiraoka and that of the instantly claimed invention, it is expected that the carbon fibers of Hiraoka have about 100 ppm or less of metal impurities. There is no difference seen between the carbon fibers of Hiraoka and those of the instantly claimed invention.

Claims 13-16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harada et al. (USPN 5,409,775).

Harada et al. teaches a vapor grown carbon fiber with a diameter of 5 microns or smaller, preferably from 0.3 to 2 microns, and a length of 90 microns or shorter. These fibers are

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subjected to a graphitization treatment consisting of heating the fibers in an inert gas to a temperature above 2,000 °C, preferably above 2,800 °C. Because no difference, which would account for a carbon product of greater or lesser purity, is seen between the process of Harada et al. and that of the instantly claimed invention, it is expected that the carbon fibers of Harada et al. have about 100 ppm or less of metal impurities. There is no difference seen between the carbon fibers of Harada and those of the instantly claimed invention.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 703-308-1772. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 703-308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-305-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



PL  
July 7, 2003

**STUART L. HENDRICKSON**  
**PRIMARY EXAMINER**